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Transgenic animals of the invention have uses which include, but are not limited to, animal model systems useful in elaborating the biological function of polypeptides of the present invention, studying conditions and/or disorders associated with aberrant expression, and in screening for compounds effective in ameliorating such conditions and/or disorders.

Example 14: Knock-Out Animals

Endogenous gene expression can also be reduced by inactivating or "knocking out" the gene and/or its promoter using targeted homologous recombination. (E. g., see Smithies et al., *Nature* 317: 230-234 (1985); Thomas & Capecchi, *Cell* 51: 503-512 (1987); Thompson et al., *Cell* 5: 313-321 (1989); each of which is incorporated by reference herein in its entirety). For example, a mutant, non-functional polynucleotide of the invention (or a completely unrelated DNA sequence) flanked by DNA homologous to the endogenous polynucleotide sequence (either the coding regions or regulatory regions of the gene) can be used, with or without a selectable marker and/or a negative selectable marker, to transfect cells that express polypeptides of the invention *in vivo*. In another embodiment, techniques known in the art are used to generate knockouts in cells that contain, but do not express the gene of interest. Insertion of the DNA construct, via targeted homologous recombination, results in inactivation of the targeted gene. Such approaches are particularly suited in research and agricultural fields where modifications to embryonic stem cells can be used to generate animal offspring with an inactive targeted gene (e. g., see Thomas & Capecchi 1987 and Thompson 1989, *supra*). However this approach can be routinely adapted for use in humans provided the recombinant DNA constructs are directly administered or targeted to the required site *in vivo* using appropriate viral vectors that will be apparent to those of skill in the art.

In further embodiments of the invention, cells that are genetically engineered to express the polypeptides of the invention, or alternatively, that are genetically engineered not to express the polypeptides of the invention (e. g., knockouts) are administered to a patient *in vivo*. Such cells may be obtained from the patient (I. e., animal, including human) or an MHC compatible donor and can include, but are not limited to fibroblasts, bone marrow cells, blood cells (e. g., lymphocytes), adipocytes, muscle cells, endothelial cells etc. The cells are genetically engineered *in vitro* using recombinant DNA techniques to introduce the coding sequence of polypeptides of the invention into the cells, or

alternatively, to disrupt the coding sequence and/or endogenous regulatory sequence associated with the polypeptides of the invention, e. g., by transduction (using viral vectors, and preferably vectors that integrate the transgene into the cell genome) or transfection procedures, including, but not limited to, the use of plasmids, cosmids, 5 YACs, naked DNA, electroporation, liposomes, etc.

The coding sequence of the polypeptides of the invention can be placed under the control of a strong constitutive or inducible promoter or promoter/enhancer to achieve expression, and preferably secretion, of the polypeptides of the invention. The engineered cells which express and preferably secrete the polypeptides of the invention can be 10 introduced into the patient systemically, e. g., in the circulation, or intraperitoneally.

Alternatively, the cells can be incorporated into a matrix and implanted in the body, e. g., genetically engineered fibroblasts can be implanted as part of a skin graft; genetically engineered endothelial cells can be implanted as part of a lymphatic or vascular graft. (See, for example, Anderson et al. U. S. Patent 5,399,349; and Mulligan & 15 Wilson, U. S. Patent 5,460,959 each of which is incorporated by reference herein in its entirety).

When the cells to be administered are non-autologous or non-MHC compatible cells, they can be administered using well known techniques which prevent the development of a host immune response against the introduced cells. For example, the 20 cells may be introduced in an encapsulated form which, while allowing for an exchange of components with the immediate extracellular environment, does not allow the introduced cells to be recognized by the host immune system.

Transgenic and "knock-out" animals of the invention have uses which include, but are not limited to, animal model systems useful in elaborating the biological function 25 of polypeptides of the present invention, studying conditions and/or disorders associated with aberrant expression, and in screening for compounds effective in ameliorating such conditions and/or disorders.

All patents, patent publications, and other published references mentioned herein are hereby incorporated by reference in their entireties as if each had been individually 30 and specifically incorporated by reference herein. While preferred illustrative embodiments of the present invention are described, one skilled in the art will appreciate that the present invention can be practiced by other than the described embodiments,

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which are presented for purposes of illustration only and not by way of limitation. The present invention is limited only by the claims that follow.

CLAIMS

We claim:

1. An isolated nucleic acid molecule comprising
 - (a) a nucleic acid molecule comprising a nucleic acid sequence that encodes
5 an amino acid sequence of SEQ ID NO: 111 through 201;
 - (b) a nucleic acid molecule comprising a nucleic acid sequence of SEQ ID
NO: 1 through 110;
 - (c) a nucleic acid molecule that selectively hybridizes to the nucleic acid
molecule of (a) or (b); or
 - 10 (d) a nucleic acid molecule having at least 60% sequence identity to the nucleic
acid molecule of (a) or (b).
2. The nucleic acid molecule according to claim 1, wherein the nucleic acid
molecule is a cDNA.
- 15 3. The nucleic acid molecule according to claim 1, wherein the nucleic acid
molecule is genomic DNA.
4. The nucleic acid molecule according to claim 1, wherein the nucleic acid
20 molecule is a mammalian nucleic acid molecule.
5. The nucleic acid molecule according to claim 4, wherein the nucleic acid
molecule is a human nucleic acid molecule.
- 25 6. A method for determining the presence of a prostate specific nucleic acid
(PSNA) in a sample, comprising the steps of:
 - (a) contacting the sample with the nucleic acid molecule according to claim 1
under conditions in which the nucleic acid molecule will selectively hybridize to a
prostate specific nucleic acid; and
 - 30 (b) detecting hybridization of the nucleic acid molecule to a PSNA in the
sample, wherein the detection of the hybridization indicates the presence of a PSNA in
the sample.

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7. A vector comprising the nucleic acid molecule of claim 1.

8. A host cell comprising the vector according to claim 7.

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9. A method for producing a polypeptide encoded by the nucleic acid molecule according to claim 1, comprising the steps of (a) providing a host cell comprising the nucleic acid molecule operably linked to one or more expression control sequences, and (b) incubating the host cell under conditions in which the polypeptide is produced.

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10. A polypeptide encoded by the nucleic acid molecule according to claim 1.

11. An isolated polypeptide selected from the group consisting of:

(a) a polypeptide comprising an amino acid sequence with at least 60%

15 sequence identity to of SEQ ID NO: 111 through 201; or

(b) a polypeptide comprising an amino acid sequence encoded by a nucleic acid molecule comprising a nucleic acid sequence of SEQ ID NO: 1 through 110.

12. An antibody or fragment thereof that specifically binds to the polypeptide

20 according to claim 11.

13. A method for determining the presence of a prostate specific protein in a sample, comprising the steps of:

(a) contacting the sample with the antibody according to claim 12 under

25 conditions in which the antibody will selectively bind to the prostate specific protein; and

(b) detecting binding of the antibody to a prostate specific protein in the sample, wherein the detection of binding indicates the presence of a prostate specific protein in the sample.

30 14. A method for diagnosing and monitoring the presence and metastases of prostate cancer in a patient, comprising the steps of:

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(a) determining an amount of the nucleic acid molecule of claim 1 or a polypeptide of claim 6 in a sample of a patient; and

(b) comparing the amount of the determined nucleic acid molecule or the polypeptide in the sample of the patient to the amount of the prostate specific marker in
5 a normal control; wherein a difference in the amount of the nucleic acid molecule or the polypeptide in the sample compared to the amount of the nucleic acid molecule or the polypeptide in the normal control is associated with the presence of prostate cancer.

15. A kit for detecting a risk of cancer or presence of cancer in a patient, said
10 kit comprising a means for determining the presence the nucleic acid molecule of claim 1 or a polypeptide of claim 6 in a sample of a patient.

16. A method of treating a patient with prostate cancer, comprising the step of administering a composition according to claim 12 to a patient in need thereof, wherein
15 said administration induces an immune response against the prostate cancer cell expressing the nucleic acid molecule or polypeptide.

17. A vaccine comprising the polypeptide or the nucleic acid encoding the polypeptide of claim 11.

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SEQUENCE LISTING

<110> Salceda, Susana
 Macina, Roberto
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 Cafferkey, Robert
 Ali, Shujath
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<120> Compositions and Methods Relating to Prostate Specific Genes and Proteins

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10

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<210> 24
 <211> 417
 <212> DNA
 <213> Homo sapien

<400> 24
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 tgaacagaaa catgcttact ttttcttagg gacctaggtt attactatct ctactctgat 300
 tcatgtctta caagtaacac atgtccccc aattcagaaa aggtacctgc ccgggcgccg 360
 ctcgaaattc cagcacactg cggccgtaca agtggaggcg agctcgtcac agctgat 417

<210> 25
 <211> 183
 <212> DNA
 <213> Homo sapien

<400> 25
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 agatttctgt gaaatgaaga taggtaaata aagatttttc tatttttttaa aaagttcttt 180
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<210> 26
<211> 319
<212> DNA
<213> Homo sapien

<400> 26
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ctctgaccgg acaacaatat ccaaaatcat tggctaactc cactgctatt gtatagagtt 180
ggggccttct cgttcatggt tacagctcgg gaagttacac tatccccatt ttatggatga 240
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cctggcataa agtacctgc 319

<210> 27
<211> 366
<212> DNA
<213> Homo sapien

<400> 27
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aattatctct gttcacatat catatgatct catatgtaaa aaacatatc cacaatttcc 180
acaaaaaaa aaccctgtta gaactaataa ataaatacaa caaagcagca ggcataaaca 240
aaaatcatca cgcaaaaatc agtcacattg ctacacacta aactgaaca atctaaaaag 300
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<210> 28
<211> 180
<212> DNA
<213> Homo sapien

<400> 28
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gtgaaactat tttgtagaaa aaggaactag tcaactttta tttttttacc aattattaat 180

<210> 29
<211> 833
<212> DNA
<213> Homo sapien

<400> 29
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 tattttatcc tttttcatgt attatagata aaattgtttt cttatttggt atagttaatg 540
 gttactctat agaaatgtaa ttaatttttg ctgatttttg taccctgaaa ttttgcttaa 600
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 tttggatgca ttttgttcct ttttttttct tttgcctaac tgctccagcc agacttccag 780
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<210> 30
 <211> 707
 <212> DNA
 <213> Homo sapien

<400> 30
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 gattaacatc tctccctccc gaaccttcgc cgggcggcgc cgtcctcaaa cgccagaatc 180
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13

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<210> 31
 <211> 264
 <212> DNA
 <213> Homo sapien

<400> 31
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 ccttgagcta atttagatgc cccaagtaag ctgatgtggg attctaattgg tgtgatgact 180
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 aagccgaatt tcaggcacac tggg 264

<210> 32
 <211> 349
 <212> DNA
 <213> Homo sapien

<400> 32
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 gagaagaaag cgggttgccc tttggaagaa cagcagatat accaggatgg ctgagggttag 300
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<210> 33
 <211> 482
 <212> DNA
 <213> Homo sapien

<400> 33
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14

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<210> 34

<211> 418

<212> DNA

<213> Homo sapien

<400> 34

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ccagaacaag ggtttttgaa tctgagcaga agctcaatta tcagagaact aaggcatgac 180

tctaggacca ttcttaggat aacagcattg atcctgagtc acctgcatgt tggaaaaggg 240

cctattttaa tgccatcatgt ttaaggtctc cattgaacct ggagattacc cagatgtgca 300

ggtggagatt agccagagca ggatttgag gtgggggttaa agtcacacct ggaagggatg 360

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<210> 35

<211> 459

<212> DNA

<213> Homo sapien

<400> 35

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gggaaaggag aactgggatg aagagtataa ggtagaaagg gaatgcagag ttgaggatcc 120

aggaaatgac ttagttccag aacaaggggt tttgaatctg agcagaagct caattatcag 180

agaactaagg catgactcta ggaccattct taggataaca gcattgatcc tgagtcacct 240

gcatgttga aaagggccta tttaaatgcc tcatgtttaa ggtctccatt gaacctggag 300

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atccttggaa gggatgggtc tgaacatttg agaactctga cactttatag actattattg 420

ataatattaa aagtacctcg gccgcgacca cgctaagcc 459

<210> 36

<211> 372

<212> DNA

<213> Homo sapien

<400> 36

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15

gaattacaca gtgagcagta atacagccta cctagatcct accattaaca ttggttatct 180
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 tacattttta agtagatgca gacatcagta aacatttaag ctccttatca ttatcagtgt 300
 tttaatatct atttgtaggt ttcttttcta ggtaaaattt gcataaagta acgaattgca 360
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<210> 37
 <211> 486
 <212> DNA
 <213> Homo sapien

<400> 37
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 ctactgtaat ttaaaacttta atggctcaaa aatgctaaat tacaaaatag agaaagatgt 180
 gtgttaaatg cagattaata taattttaat aatattatat ataataagga ttgtaaaac 240
 ttaaccatta agatggatag atgagaaaga tagaaacctt gaatacaaca ctagaaaatc 300
 tagaaacata gtagagatga gttcaataat tcgattctat ataagaggtc atcaaactac 360
 aaagcacaga gctaactcagg ccaactgatgc attttggtta acaaagtttt attagaataa 420
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 gttggt 486

<210> 38
 <211> 920
 <212> DNA
 <213> Homo sapien

<400> 38
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 tatactgcgc tggatgcgc tatataaaat atctcacaat aacctatatt tctcttccca 480
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<210> 39
<211> 151
<212> DNA
<213> Homo sapien

<400> 39
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ggataccgtg cccggggaggg ccgcttcgaa a 151

<210> 40
<211> 584
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (147)..(472)
<223> a, c, g or t

<400> 40
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tgggggcggc gtgctacaca cctttttnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 180
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nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnaa tnaaccaaga 480
caccacagac agacacagcc acagacagca cgagcacaca tagcacacac cacacatcga 540

aggagacaac aaagaagcaa tcgaaacaat tacgaaaaag aaga 584

<210> 41
 <211> 427
 <212> DNA
 <213> Homo sapien

<400> 41
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 cagccactct agttttctcc tttagtgaca gaccgtgatt cttatcagag cacatttaca 180
 atagaaaaat ggtaattct tatgtatgat cctaaactga aaaagaatca tagttattaa 240
 tatggcaata gccaaaagaa aactctgcat gagaacgaga taataactac aatgtaataa 300
 tttagtcttc tttcaagttg cagggatggg cacattaagg aaccagtatt tttttaatgg 360
 gctagaacag aaagcgaagt gtatcatata gaatgacaat aagtaatgct acaagaaatg 420
 tttgtgt 427

<210> 42
 <211> 331
 <212> DNA
 <213> Homo sapien

<400> 42
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 gtgtctcgcc tctgtcacc aggccgaagt tccgcagtgg tgcaactctt cggctctcac 180
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<210> 43
 <211> 452
 <212> DNA
 <213> Homo sapien

<400> 43
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 cgcaaatgat aaaagcagac ctctcagata tcagcttccc taagaagtct gcgttgatgg 180
 agtatacagg cagtttactt ctctgctcag gggataagca agccccata aaagctgaaa 240

18

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<210> 44
 <211> 481
 <212> DNA
 <213> Homo sapien

<400> 44
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 ctacagtcac agttcaaagc ttaccagaca atgttttctc ctcttttttc tagtaactaa 420
 gatattaaaa gtcttcatgt ggaaaatgct ttttccaacc atgctaaaat ttcaaccttg 480
 t 481

<210> 45
 <211> 616
 <212> DNA
 <213> Homo sapien

<400> 45
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 atctggacag tatggattaa gaggaagaaa ttgagacacc ttacccccct tttctccct 180
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 actaaaagaa agagttggaa aaccatacct acaagaagag tgaactgcgg tcttgaagca 300
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 ctactttaaa gaaaaatgta ataatatcac aatctctaca ataaatgttt tagcatagca 540
 ctaaaccac aatatgctaa aaaagttgtc agtagaggag acagaaaata atctaaagaa 600

caggattgac tgggtgt 616

<210> 46
 <211> 548
 <212> DNA
 <213> Homo sapien

<400> 46
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 aactaatcc atactattta agaacaaaag aagctgtttg gactaaataa tgaaaagtct 120
 gtgtcactgg ccacagttcc aaataaaaaa cgggtgtgaga gaataaagtg tatatgaagt 180
 gagaataaga tatatatggg gcttctcaag aattctgata gagatgtgtg tgtgtgtgtg 240
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<210> 47
 <211> 298
 <212> DNA
 <213> Homo sapien

<400> 47
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 taaagtaact attattaatt taatttgttt attcaaaatt atatactgtg cacttactct 180
 gtaccaggcc catactaggg tctgctgatt ccggagacca aggaaaattt ccttctccat 240
 gctccaagga attcacatgg gtgagctagg gaaaagaaaa aatcaatgat aatacagt 298

<210> 48
 <211> 408
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (61)..(347)
 <223> a, c, g or t

20

<400> 48
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 nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnntca tggatcaaaa 360
 gaatcaatat tactaagatg gctgaactgc ccaaagcaat gtacctgc 408

<210> 49
 <211> 422
 <212> DNA
 <213> Homo sapien

<400> 49
 acatgaatct caaagacctc caatcaggtt ccacccaaag aggaattcac caagacatat 60
 tataatcaaaa ctgtcaaaaa ttaaacatag agaatcttga aagcaggaaa gaaagggagt 120
 tgagaagtga tgtctgcaag atggcttaca catacctgcc acttatgccc ctcacaaaaa 180
 acaactgaaa ctcaattaga gtgtcagagg gaaagcatta aagtgtagca agagagtagt 240
 gagattccct gtagtgttca gaagcccagg aaggcagcat agtgaggggtg atggggcacc 300
 ctgcctctgc cagctcatgt tccctgctga gattagcttg gagtcaagag ggactacccc 360
 cttgagggga aaaggtaagc aaaagatccc caccagcttc cattgccact gaagagacct 420
 gc 422

<210> 50
 <211> 236
 <212> DNA
 <213> Homo sapien

<400> 50
 ggcttgggca ggtacatgct cacatgtaag gctgagaatg gtgtctgttc ccatcagcca 60
 aactgatgga aaacttgtaa ttcaacaggt attagatagg tgacacagta gtatctttcc 120
 tcagtagtgg agaataatta gaaagaaata ctagaaaaaa ttagaaactt acataaagaa 180
 ccaagagaag ccgaattcag cacactgctc cgtataagtg atgcagctcg tccact 236

<210> 51
 <211> 416
 <212> DNA
 <213> Homo sapien

21

<400> 51
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aggagccaat tgatccagaa tagaagaaag aaaggaaata aagattagag taacaataga 120
tgacataaat aaatctaaaa ataggggaaa aaatcaatga aattaagagt tttgtctttt 180
aagataaaca aaactgggca aacacttagc taaactaaaa gaaaaaacag aaaacaaaaa 240
taaataaaat aataaatgga agagatatat tacaagaga tcataaaca tagattataa 300
aaaatatgac aaatagatca tagacacaca aatcataaat gatattacca aaaactacac 360
acaaaaatat tgaacaactg ggaaaaagtg aataaatttc tagaagcata caacat 416

<210> 52
<211> 354
<212> DNA
<213> Homo sapien

<400> 52
gcaggtagcat ttttaatgtc tcaataaata ttataaaaaca ggccttaaaa ttctatatcc 60
catgtgagga aaacacttta aaaaaaaagg tttaaaaaaa tgggggcatg aagcaatttc 120
taagcaagcc ttataagctt gagtttcatt aaaaaaaaaa aaatcagaca ctgaaaagcc 180
taggggggaa aaacaacatt gctcacactg agcctaattt tggagactat tacaaaaata 240
aacaatgat gatgaatgaa ctttcttatg gtaattaata ggaagcgaa aaagccggtg 300
tctccaagaa tgaagccaga ctctatgaaa aggaccggga gttggtgaagg tacc 354

<210> 53
<211> 630
<212> DNA
<213> Homo sapien

<400> 53
accaggctg gacttcaact cgtaggctca agtgatcctc ccacttcagc cttcacaata 60
actggtgcta cagacacaca ccaccacacc tggcttcttg aatacattga atctaattat 120
attgattagt ttcaaatatg tatttctata ttatggcctg atggacataa taataatatt 180
acaaggtagt ctaaaaataa aaatgtgtta cagaattccc attttattat ttcttttttt 240
ctttcttttt gacctgataa cagaaaagag catcttctca gatagacaaa aatctccttt 300
ctattcagcg catcaatacc acgcacatct tcgtctatct cccaacatgc tctcttctct 360
gttatcagcg caaceccccc cccacccccc caccacccaa cagtggacca ctggaccgca 420
ccaccacaac agaccgcaaa cccgcggcga cccccccac agtcgccagg gcggccgcac 480
caccgggcca tacaaggggc gcacagcacc gaccggctac gccagcagcc ggacgcaaac 540

22

acagcgcagg agcctcagaa gcggcgcccg gacggcacga gactcgtggc gaccactgtc 600
agagcgggctg tccggaccaa cacagataaa 630

<210> 54
<211> 297
<212> DNA
<213> Homo sapien

<400> 54
accacctgat gtcaggatca tgaaatcatt ttgaggaagg ggggtgggtcaa attattcaaa 60
taatgctctt ccaatttcct gcttggagga gaaagaggtc tggaaatatt aatattcagt 120
atgtaaatcc atcatattct ttatggttcc catggcctca ctctatctgt agtttctcag 180
aacctttggt ttatccactt tagagaatta agcctccggt tttctgctga ggcaggagag 240
gtgcagtcac ctgggcttag ccgactttca accaatacag tgtttggtgt tcctgt 297

<210> 55
<211> 124
<212> DNA
<213> Homo sapien

<400> 55
acatttctgg atatgcatat tagttgtgaa aacccaaaca gaaatttagt ttttaagtagt 60
tacagactaa aactcatgaa tacctaacag aagcaaacac aaattgtttc taagaggatg 120
cact 124

<210> 56
<211> 183
<212> DNA
<213> Homo sapien

<400> 56
ggaaaagtcc ttgaagtcac taatttagtc atttttcaga gaactgtaga cgagacttca 60
gggaagtcaa ctcaaaacag ttttcaccca gtggagttat ttagtggtta gcatgaaaat 120
tttttttctc aactttttat ttcaaacttt ttcaagttta cataatgttt aaagattggg 180
tca 183

<210> 57
<211> 338
<212> DNA
<213> Homo sapien

<400> 57
gtgtgaattt ataattactt taaaataaaa tgtttaatta aaatacacag gataatattc 60
atgagaattt ttcagtataa caggttctcc aagagcagtg ctaggacaat caaaaacaca 120

aattctctac actgagtttt ccaaggagta aacaacacca ccaaaaaatt caaaaccaa 180
 acccaaaaca aagaagcatt cccattttaa aaggaccta acttgactct gcttcagacc 240
 tactaaatca gaatttctag gttgggtttc aagaaaatgc atttttctaa gttccactgg 300
 tgatttttat gcacatgact gcaaaggaat cacagaga 338

<210> 58
 <211> 899
 <212> DNA
 <213> Homo sapien

<400> 58
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 gtgcaggaac ttcataaaga tggaggctac caaagagtaa cagtaactgg catctttatg 180
 acgtcagacg cacattacgc tacacgacaa gatattattg taaataattg caaccactc 240
 tttacggtag ataattattat tcctcttatt aaacaataga aataaaattg agagatgtta 300
 tggtaacttt cttcaaggtc aaaccaacaa taagtaagat ggcagaccga ttggacgtca 360
 aactacaaat catgcctgac gtcttaggag ccactcatta atcattacaa cctgtcgtcc 420
 ataaccacac taatatacaa gcacgtgaat gttaatggat taaattgaca agtggataaa 480
 tgagagtga gatacatgt tagtagttat aaaaagcaag gatgatgaag aagtagaaga 540
 aaaaagatga aggtggcaga agtcagtgat ttactgggta taagaaaaaa atataagaag 600
 tgtataacaa ctgacaagag gatttgtggc gttgaacaaa atgatggaaa tgatggtggc 660
 tttactggga aatgaataga aaggaggaga agacttgatg ggagtgggaa agagataagg 720
 cattcagctt taatgctgtg gacttcattg ttgctatgaa aatgcaaag gagatatttc 780
 atctacagga gttgaagggg ccataatata ctttatcatc gctctctggc acctaagata 840
 cctcgccaac ccgaagtaca gcacactgag ccgctatacg tgagacgagc tcgtgcacc 899

<210> 59
 <211> 406
 <212> DNA
 <213> Homo sapien

<400> 59
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 tggaaattgc caccaaaaag tgtgtatata gctactatgc ccaaattaag ccattcaatt 120
 tttttaaatt aaatgcctaa tcaacgaact aggaaaggac tggcacaac tggggtaatt 180

24

gattatgaac tttacaatg ttaactttca cgataagaat ttgtacgagg gagcagggaa 240
 tctgcaacaa cccatctcat gcattttcgt ccactctgat tgtatcatta tgatacgtaa 300
 gaatgcctca tcctacaact actaacttta ataacaaaaa gcatgggtaa tttgcatagg 360
 cctatcatac aacttccttt acaatatggc agctcccata agaagt 406

<210> 60
 <211> 212
 <212> DNA
 <213> Homo sapien

<400> 60
 ttatccgaaa tacttgggac cagaagtgtc tcaaattcct tttttttttt tttaaatttg 60
 ggaatttgca tttatccatt gctgatttta gcattcccat aattctgaaa ttgttcaaaa 120
 ttcttgaatt tttccaatta acgcttttcc ttttgaacat tcattttggc acttggaat 180
 tgtttgtgga ttttgggggc atttgggatt tt 212

<210> 61
 <211> 376
 <212> DNA
 <213> Homo sapien

<400> 61
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 tttgctcaat gactagatta ttgctgcttt tgacatggaa ggcagtgatg ggtaaatgta 180
 tgagataatg gacatattaa tctgttccac tgtagtatat gtgtagctta aagcaacatg 240
 tcatatacct taaatataaa caaaagtaac tttattttaa gaaaaaacag ctgatactgt 300
 taagtcacct agattggagg gtgaatgtga taccacagcg aaagtctaga atgatttgtg 360
 aaccaatata cattaa 376

<210> 62
 <211> 547
 <212> DNA
 <213> Homo sapien

<400> 62
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 atttcattgt aatgagtttg gttgtgtctg ttcttcatgg cttttacagt aatgatttag 120
 gcatcataga tctgatgaga gtccagggtc ttgtctgcaa gcaacagaag ccaacttttg 180
 ctaacttaag caaaacagca acaacaaaca ttactggac agataataag tagctcacia 240

25

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agtcaatgtg aagactgcaa aacagaaaaa aaagattgaa agatgggtgt ggaggaaata 300
aaaactagga taagggttaa gaaatggcca cacgaactat tttcttagga tatcactact 360
gactatgcca ggaatgctgt aaagctatgc catagataat tatcgaaata gctccatgtt 420
gttgcaccat tgtctcaaga ctaaaattcc cagaatggag cagggtagga gtcagggcag 480
aggatccagg tacctgcccg ggcgcgcgtc gaagccgatt gcagcacact gcgcgcgtata 540
tcatgga 547

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<210> 63
<211> 777
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (170)..(412)
<223> a, c, g or t

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<400> 63
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aacaaactaa atagccatta acaaacgaat agataaaaaa aggtgatatn nnnnnnnnnn 180
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 240
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 300
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 360
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nntatataca 420
tacaaaggca tattattcag ctcaaaacac aaaacgaaat cctgccatat gtgcactact 480
tgatgagcc ttaaggatgt catattagaa ttagtcacag gaagggacaa attgctgcta 540
ggtaggtatt ctcatcttct gaaagtactc ttaaaactgg gtccaaccaa tacgaaacgg 600
gggcgtcgca aatggtggtt ttcccgggaa gaacagtaag gagaaatcaa gagctataag 660
ccagggtaat aatcttctta ggaaaggaat atttagatcc gtactggcaa ccgattccga 720
cgagggccga catggccagc ggacaatggg actgcacggt ctgggagtct catgaga 777

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<210> 64
<211> 800
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature

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<222> (561)..(760)
 <223> a, c, g or t

<400> 64
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 tgagtgcaca aaatgggggc caagtgaagc taaccgattt tgaaaaatgg gggagggaggt 120
 gatggctaag aggataaggc accattaata caatcccaa agggtcaac tttgcaagag 180
 atggcaaaat ccaaaaccca ttgctctagt gggattatat acaagtaaag atgtatctaa 240
 gagtttcatt tcatgcacac atcaaacagc acaaattttg ccatctcagc agcacaaaaca 300
 ggtagtcat aagggatcca tcaacacatc cttaaacttca tatgcaagtg ttgtagctat 360
 ttgccataat gtttatatac aaagttcggc ctctttaaaa agtgagagtc caggaaaaat 420
 atgaaaggaa tattgaaaat gatattatac cagtatctac tttgcaacat gtatctttgt 480
 caaatcacia agtaataact tgctaatacc tacagtgaat tataatcttat aataagaagt 540
 aagtaaagag aacagtaaag nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 600
 nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 660
 nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 720
 nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn tagtcaaac atgactaagt 780
 tgattgccga ttgccccaga 800

<210> 65
 <211> 335
 <212> DNA
 <213> Homo sapien

<400> 65
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 aaataaaaacc ttgataattt acaccaacat tagtagaact ttggtaagct acagtatatg 120
 tggaagtggg aggaaatgac gaggtccat tcctgtgaaa tctattgtta gtaatcagaa 180
 tcataggatc tgagtatgtc agggagaatg aataggctgg aatatatacc agtagggaat 240
 atcagccttg aagtcgttgc cttgttgcta ttcctagcaa ataaaagatc cagactgttg 300
 aaatatgtag caaggatatg ttccaggaaa acact 335

<210> 66
 <211> 690
 <212> DNA
 <213> Homo sapien

<400> 66

27

attgggcacg agggggccttt tgcaagaatt attgaacaag atgctgtagt ctcagagagg 60
 ggaaaaaatt gggggcctttt cttctgtgta taaacagcag tggtttgcta tgctgcgggc 120
 agaacaggac agtgaggtgg ggcctcaaga aatcaataaa gaagaactag agggaaacag 180
 catgaggtgt ggtagaaagc ttgccaaaga tggatgaatac tgctggcggt ggacagggttt 240
 taacttgggc ttcgacctac ttgtaactta caccaatcga tacatcattt tcaaacgcaa 300
 tacactgaat cagccatgta gcgcatctgt cagtttacag cctcgaagga gcatagcatt 360
 taggtaggat gagatttccc caccctactc ctctcactc cagagaaaat ataagaaata 420
 aaaccttgat aatttacacc aacattagta gaactttggt aagctacagt atatgtggaa 480
 gtggtaggaa atgacgaggc tccattcctg tgaaatctat tgtagtaat cagaatcata 540
 ggatctgagt atgtcaggga gaatgaatag gctggaatat ataccagtag ggaatatcag 600
 ccttgaagtc gttgccttgt tgctattcct agcaaataaa agatccagac tgttgaaata 660
 tgtagcaagg tatgtttcca ggaaaacact 690

<210> 67
 <211> 194
 <212> DNA
 <213> Homo sapien

<400> 67
 acccgggact ggattaaggg gccgaactta caagggtatt aaagaagata ggtcctatatt 60
 gacagcatct cataatttaa cagtataaac caaaatggaa accaaaagag aagaatgtcc 120
 tacaatagaa gtgtgagtat actgctgtgg gagcagggaa taattgggaa ggaaaagctg 180
 gaaaaccctt aggt 194

<210> 68
 <211> 717
 <212> DNA
 <213> Homo sapien

<400> 68
 ttaacccctt gattatcgcc cttagcgatg ctcttgagca tgtcagcccc agtgtaggaa 60
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 tctatttcat tctccatgtg acgtatccag attgtcttca gcaacatgta tagaaagacg 180
 atcttgttat actgaaatgg cgttatacct ttgtgaaaaa agcaattggc tgttatttct 240
 tgtggatcat gtttctggac tctggtatct gtgttctaata atatctgtat ttttaacctc 300
 tctaacaata ccacattatc ttacctacta cagctgttaa aataagactt gatatcaaata 360
 aatgtgaatc tttcaatttt attcttctc agaatgttgc tggctattct agttcttttt 420

ttccatatag aatttttagaa ttagcttatt gaccgatatc tacaaaaatc cctgctggga 480
 ttttgattga gattgtgaca tatcagtaaa tcaatttggg gagcattggc atcttgaaca 540
 atactgactc tcccaatcca tgaacatggg atgtgtctct atttaggttt tctttaatta 600
 tgttcatcgg tgtttttag tagtttcagcat acatattcct gcatatttat gtttagattca 660
 tgtttaagtt ttataatttt gttcttaatg taaatgacac tttttaattc cattttc 717

<210> 69
 <211> 917
 <212> DNA
 <213> Homo sapien

<400> 69
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 caaaaggtag gtgattcttc tcccctctag tgaagaatac aaggtaatt tacaaaaaag 180
 caccaccagc aaataagtgg aaaattagat tcataaaaca tttataatag cgtcaaaaaa 240
 aagaaaatac tcagaaataa atttgacaaa aattgtataa gatctctaca ttaaaaatta 300
 tgaaatacat gtaagagaaa ttaaagaaaa cctaaataga gacacatacc atgttcatgg 360
 attgggagag tcagtattgt tcaagatgcc aatgctcccc aaattgattt actgatatgt 420
 cacaatctca atcaaaatcc cagcagggat tttttagat atcgggtcaat aagctaattc 480
 taaaattcta tatggaaaaa aagaactaga atagccagaa caattctgag gaagaataaa 540
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 aatgtggtat tgtagagag gttaaaaata cagatatatt agaacacgaa taccagagtc 660
 cagaaacatg atccacaaga aataacagcc aattgctttt ttcacaaagg tataacgcca 720
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 atggagaatg aaatagaccc acttttatca tatttttaaa ttgtggtgta ctcggcgcac 840
 aagatagcaa tttgagattc ctacactggg gctgacatgc tcaagagcat cgctaagggc 900
 gataatcagg ggggttaa 917

<210> 70
 <211> 411
 <212> DNA
 <213> Homo sapien

<400> 70
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29

gatataaatg atttttagga caattccaca ggcttgaaga acatacagtg gcttgggaca 120
aagtttggtg ggccacaaaa agcacataat ggtttgtaac aaaagtatga ccctgtgtgt 180
tggcagattt cagtctttat tcttgtaagt ttagttaatg caaactaact aaagaggaaa 240
acagctagga gtaattgttt tctttgacag ttccaaactt tagtcagaga gggaacttca 300
gagatcaact tcattctatg ctttaagaga gacagaggat taagagacag gaggtgagtg 360
gtgcaggtta gagagaactt gaagtttctt caatacagca tgtcaaagca c 411

<210> 71
<211> 564
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (463)..(463)
<223> a, c, g or t

<220>
<221> misc_feature
<222> (505)..(505)
<223> a, c, g or t

<400> 71
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atcagaaaaat ataatgaata ttttagcatt ccaagcagtc atagctggaa ggagatccaa 180
ttttcctaata aacactaagc ttgcttagaa gagtctctct ttctaacaaa tttactttgg 240
aaciaagggtc tcatattttt catactatta ctggcagcaa attttcatct ttcaagaaga 300
atgtgagttt agaaatagcc agaagtcggc cggaatggt ggctcacgcc tgtaatccca 360
gcactttggg aggaggattg cttgatccca gaagtttgag actggcctgg gcgacataat 420
gagagccccg gtgtctgttg aaaagaaata gactgggtgc cnggggtcat gcctgtaatc 480
ctagcacttt gtgaggccta catgngtaga tcgtttgacg gcaggagttt gagaccagct 540
tgcgaaatct gtcttcttcc aaaa 564

<210> 72
<211> 598
<212> DNA
<213> Homo sapien

<400> 72
gggcgcagtg tgctggcatt cgggttgccg aggtacagct tcagcaggag caaccataaa 60

accattccca taaggagga tatccagggg gaaagtttca ttaaagcaga aaactgaagt 120
 taaacccaag aaaatagaga tacttgggca atataaaaag aacattaata agaataagatt 180
 ttatcatctt caaagcaatg aaaaaagaaa taatacccat aaaagaccag gaaagaagaa 240
 aatgaaaacg tctttaaaat gcaaaacatt tatgaaatta aaaaatttaa tagatagatt 300
 taaaaggcta gacatcaatg aactggcaga aagaaatgaa aaaaatcact gaaaaagcta 360
 tcaaaaaaga taaaagctg aagaaaaaaa gaaggaaaag ttcaaagata agttccaaca 420
 tatatttgac aatagtttct taagcataga ctagagagag tgttgaagggt gtgggtgtgt 480
 aagacagtag ttgggaattt tccaaaactg aagagagtcc tgagttctga ggctgagaga 540
 gctcatcaag tgacaagaag ggcggatctt taaaaatcta tatctagaaa tactgtgg 598

<210> 73
 <211> 248
 <212> DNA
 <213> Homo sapien

<400> 73
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 ccagaaacca cattagcaac tggacaaaaa gaaagccaaa aatctaaaac aggtgtccac 120
 aaactaggcc tgtggcctgt ttctataaat aaaaatttac tggaacaccg ccacaccac 180
 tcatttttat acagtccccg ctgctcctgt tgtaatggca gcgtggagtc agtgcaacag 240
 agaccata 248

<210> 74
 <211> 528
 <212> DNA
 <213> Homo sapien

<400> 74
 acgtaaggaa agtaaaaaca agtaaaaata cctgtgaagc ccatcattat acttattgat 60
 aatatctttc aaagatgaac aaaaaatgaa gactttttca gacgaacatc cgggaaattg 120
 attattagca gacctgttct accaaaagta ttaaagaaaa atttgctggc agaaagatta 180
 tgatatgata caaaagcatg gatctccaca tatacaccca cacacacaaa tgaaaagtgc 240
 tgaaatggta ttaataaagg ccaatgtaaa attcattttt cttatatatt aattctttta 300
 aaattaaaag caaattaaaa ttaaaatcta aagcaaaagt agtgacacat agagatagaa 360
 gaaggatggg gaccagaggc caggaagggt agtaggcaga agccagggca ccggagagggt 420
 agagatgggt aatgaatata aaaaaattat tagaaagaat gagtaactta gtatttgata 480

gcacgacagg gtgactattg tcaaaataat cgtagatcctt aaaataac 528

<210> 75
 <211> 726
 <212> DNA
 <213> Homo sapien

<400> 75
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 attattagca gacctgttct accaaaagta ttaaagaaaa atttgctggc agaaagatta 180
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 tgaaatggta ttaataaagg ccaatgtaaa attcattttt ccttatattt aattctttta 300
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 gaaggatggg gaccagaggc caggaagggt agttggaggc aggggaaagt ggggatgggt 420
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 ggaatgtttg taacacaaag aaatgctaaa tgcttgaggt aatggaaacc ccattttacat 600
 ggatgtgatt attatgcatt gcatgcctgt atcaaaatat ctcatatatg ccataaatat 660
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<210> 76
 <211> 580
 <212> DNA
 <213> Homo sapien

<400> 76
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 gtgggggttaa tgagcaccta tgtgaagggt tttttttttg tttttttttt tttgacagaa 180
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 agggggactc cgaccctcgg gaaccaacgc ggggggtacc cagggggcat aggcgctccg 420
 cgggtgggtg agtggtactc cgaccacatc ccacacaaat tgcaacaaat agttgacagc 480
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cacgaaaaca gcgccgacag agcgcaccag gccaccgaaa 580

<210> 77
 <211> 658
 <212> DNA
 <213> Homo sapien

<400> 77
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<210> 78
 <211> 523
 <212> DNA
 <213> Homo sapien

<400> 78
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 ggagaacagt tttatgctgt gtgagaattt acaaaggact cttagagtcc gacatttggg 180
 ccaaacaaga caggctatca cataggaaga ttttttttct cgtattgcaa ataaagaaac 240
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 gaacctttgt gcagatgcag agtcagtcac tatttaggtt gtagcagggt ccacttaatt 420
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<210> 79

33

<211> 523
 <212> DNA
 <213> Homo sapien

<400> 79
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 gtaccaaga agcagggttaa aacttaaagg atcttaaaaa aaaaaaaaaa aaaagagtgg 180
 ctcatagcaa gaaaaatttt aagggtgac ccagagcagt ccctcatttt ttatcccaaa 240
 agacaaactt agtgtttcca aattttatgg gagaaatgat aggagttgag aaatacccag 300
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 aactatgtga tcaaactctgt gagtttttag ttaaatttca attaacttcc agattcactc 420
 ctcaagcaat aactttgcta caccttgtca caaccaaagg ttctttttca aatttttttt 480
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<210> 80
 <211> 624
 <212> DNA
 <213> Homo sapien

<400> 80
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 tacacaaaat actcttagag gaattttttt ttaagtttct ttgttcaagt gacaccctat 180
 taagaaagcc cagttccttc caaggaagca aagttctaag ggtaccaag aagcagggtta 240
 aaacttaaag gatcttaaaa aaaaaaaaaa aaaagagtg gctcatagca agaaaaattt 300
 taagggtgta ccagagcag tccctcattt tttatcccaa aagacaaact tagtgtttcc 360
 aaattttatg ggagaaatga taggagttgc gaaataccca gggggcccca ggaggccct 420
 cataactgtc agttgtttta tttggggggt aaggagagt aaactatgtg atcaaatctg 480
 tgagttttta gttaaatttc aattaacttc cagattcact cctcaagcaa taactttgct 540
 acacctgtc acaaccaaag gttctttttc aaattttttt ttgccacct ttcctctgct 600
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<210> 81
 <211> 147
 <212> DNA
 <213> Homo sapien

<400> 81

34

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 ccatatagtt gccaaaaaca gcacaaa 147

<210> 82
 <211> 783
 <212> DNA
 <213> Homo sapien

<400> 82
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 aaaaaatact tttagtcatt tcttgtaaaa atgggtctgg tggatgatgaa tttggtttgt 180
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 ttacgaggggt aaatacacct ggatctggag gcttcctagg gttcctccca ttgtgataca 720
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 ggg 783

<210> 83
 <211> 271
 <212> DNA
 <213> Homo sapien

<400> 83
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 attacattcc tgtccattcc ttcgactcca ttccattaaa ttccattcca ttccatttaa 180
 ttcaatatca tccctttaca ctccattcat ttctattatt tttgattcca ttgacttgca 240
 atccatttga ttacattcca ttctattcct t 271

<210> 84
 <211> 727
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (292)..(475)
 <223> a, c, g or t

<400> 84
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 aataaaacaa aaactaccta caaccagcaa aactatattc tgcacattac aacacaggtc 240
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 gtcgcagaaa aaacttttaa tgtttaacac aagctccttt cagaccatat gttctagagc 660
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 ttccagc 727

<210> 85
 <211> 828
 <212> DNA
 <213> Homo sapien

<400> 85
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 atggaccag aggttcgtaa ggtaacattt aagaaaatga cggaatgaga taagcatgtg 180
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 tgtggggctg tgttctctat atagcattgc ttgtaaagac aacaaatttc aagttggctt 420

36

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 aataaaaaag taagaggcag catctataag gatgatccca ttgttatatc acagctactg 600
 ctgacctggg tgggtatgct tgtgttggtc ctttaaaaaat aaaaaagatt ctggaacaac 660
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 gccgaattcc agcacatgtc gccgtatcag tgatcggagc tcgatcac 828

<210> 86
 <211> 869
 <212> DNA
 <213> Homo sapien

<400> 86
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 ctttcagtgt ttggtgaact gctttggatg gtgaattatg tgtttaccct accttctct 720
 gaggattgga attggggcaa gagaaatggg aaatgggctg tgacataggt gaccctggg 780
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 acattatgta gtggttcacg gcggagcca 869

<210> 87
 <211> 944
 <212> DNA
 <213> Homo sapien

<400> 87
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<210> 88
<211> 1304
<212> DNA
<213> Homo sapien

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<210> 89
<211> 524
<212> DNA
<213> Homo sapien

<400> 89
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cacgttaaca gtagggcaaa taacattaga agtgattata gtaaacattt ttaaagttat 360
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<210> 90
<211> 794
<212> DNA
<213> Homo sapien

<400> 90
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39

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<210> 91
<211> 764
<212> DNA
<213> Homo sapien

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cacgaaacta ataaatcaga gagacaaaaa tcaggacatc caccctatag caaaagtacc 660
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<210> 92

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